

FIGURE 1

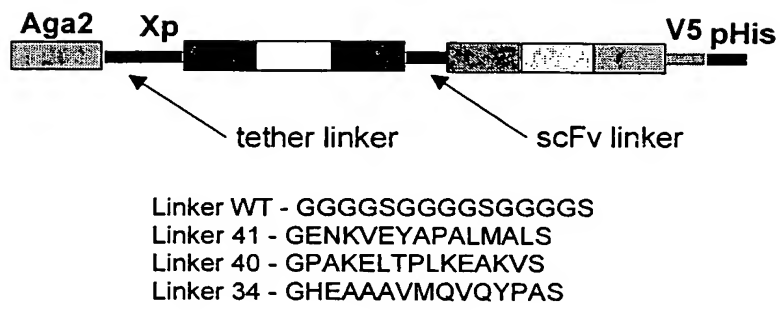


FIGURE 2

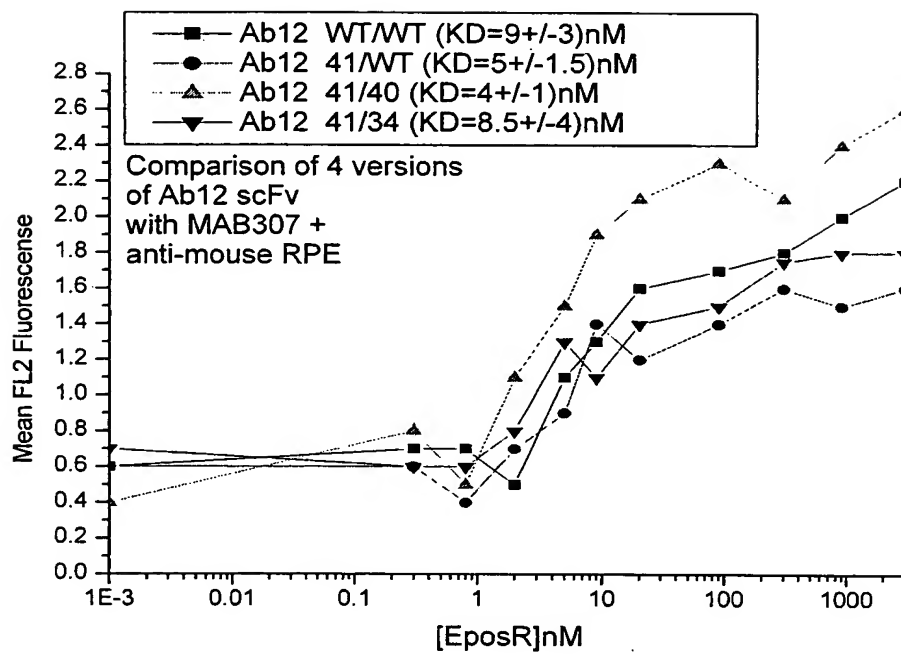


FIGURE 3

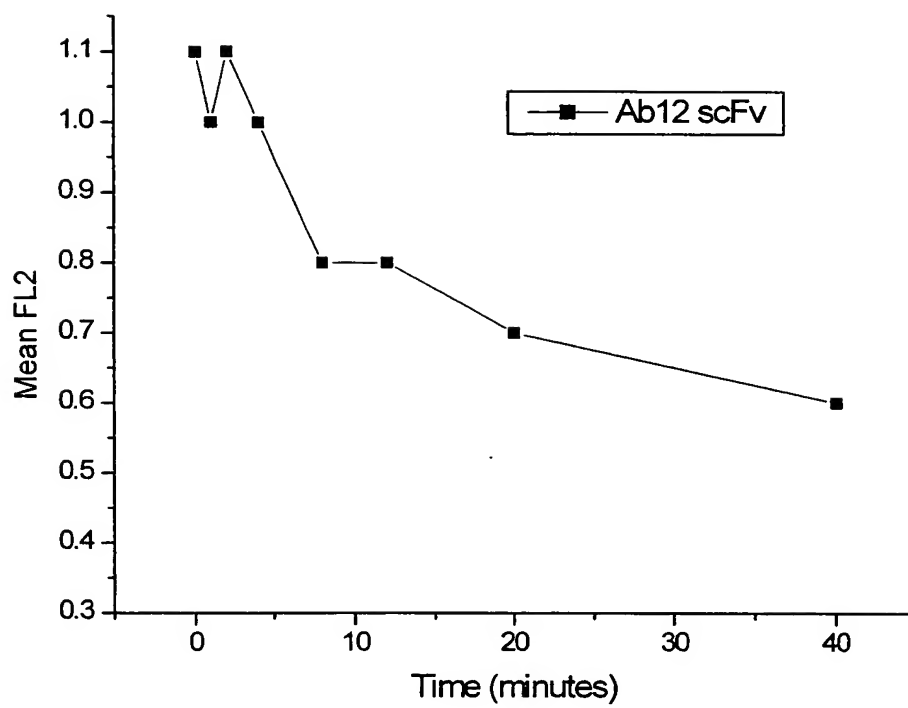


FIGURE 4

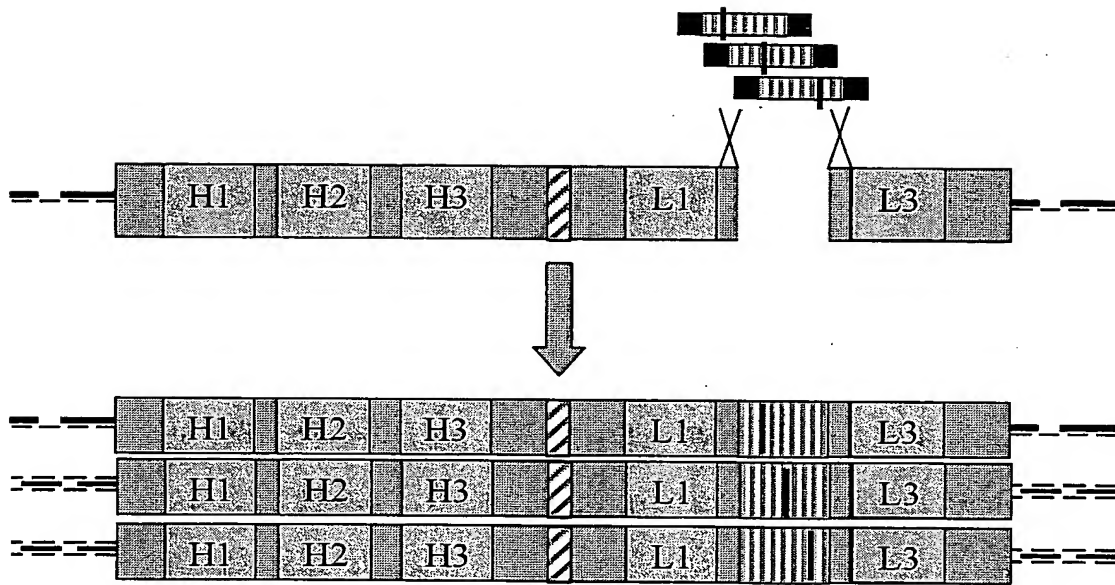


FIGURE 5

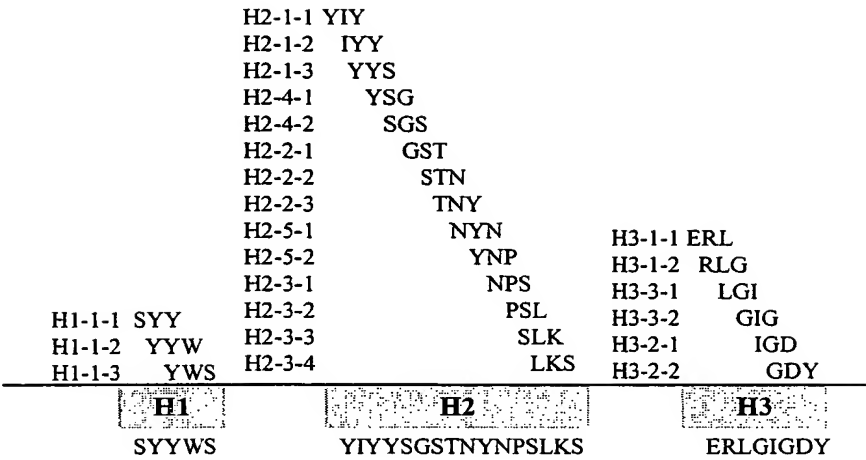


FIGURE 6

L1-1-1 RAS		
L1-1-2 ASQ		
L1-1-3 SQG		L3-1-1 LQH
L1-3-1 QGI		L3-1-2 QHN
L1-3-2 GIR	L2-1-1 AAS	L3-3-1 HNT
L1-2-1 IRN	L2-1-2 ASS	L3-3-2 NTY
L1-2-2 RND	L2-1-3 SSL	L3-2-1 TYP
L1-2-3 NDL	L2-1-4 SLQ	L3-2-2 YPP
L1-2-4 DLG	L2-1-5 LQS	L3-2-3 PPT
L1	L2	L3
RASQGI RNDLG	AASSLQS	LQHNTYPPT

FIGURE 7

SEQ ID NO:	Ab	FR1	CDR1	FR2	CDR2
5	Germline	QVQLQESGPGGLVKPSETLSLTCTVS	GSISYYWS	WIRQPPGKGLEWIG	YIYSGSTNYPNPSLKS
6	12	QVQLQESGPGGLVKPSETLSLTCTVS	GA SISYYWS	WIRQPPGKGLEWIG	YIYSGSTNYPNPSLKS
7	12.6	QVQLQESGPGGLVKPSETLSLTCTVS	GA SISYYWS	WIRQPPGKGLEWIG	YI GGE GSTNYPNPSLKS
8	12.56	QVQLQESGPGGLVKPSETLSLTCTVS	GA SISYYWS	WIRQPPGKGLEWIG	YI AGT GSTNYPNPSLKS
9	12.118	QVQLQESGPGGLVKPSETLSLTCTVS	GA SISYYWS	WIRQPPGKGLEWIG	YI GYSG STNYPNPSLKS
10	12.119	QVQLQESGPGGLVKPSETLSLTCTVS	GA SISYYWS	WIRQPPGKGLEWIG	YI YGGSG STNYPNPSLKS
11	12.120	QVQLQESGPGGLVKPSETLSLTCTVS	GA SISYYWS	WIRQPPGKGLEWIG	YI YYEG STNYPNPSLKS
12	12.121	QVQLQESGPGGLVKPSETLSLTCTVS	GA SISYYWS	WIRQPPGKGLEWIG	YI GGS GSTNYPNPSLKS
13	12.122	QVQLQESGPGGLVKPSETLSLTCTVS	GA SISYYWS	WIRQPPGKGLEWIG	YI YGE GSTNYPNPSLKS
14	12.123	QVQLQESGPGGLVKPSETLSLTCTVS	GA SISYYWS	WIRQPPGKGLEWIG	YI GYEG STNYPNPSLKS
15	Consensus	QVQLQESGPGGLVKPSETLSLTCTVS	GA SISYYWS	WIRQPPGKGLEWIG	YI X₁X₂X₃ GSTNYPNPSLKS

Ab	FR3	CDR3	FR4
Germline	RVTISVDTSKNQFSLKLSSVTAADTAVYYCAR	ERLGIDY	WGQGTLLVTVSS
12	RVTISVDTSKNQFSLKL RS VTAADTAVYYCAR	ERLGIDY	WGQGTLLVTVSS
12.6	RVTISVDTSKNQFSLKL RS VTAADTAVYYCAR	ERLGIDY	WGQGTLLVTVSS
12.56	RVTISVDTSKNQFSLKL RS VTAADTAVYYCAR	ERLGIDY	WGQGTLLVTVSS
12.118	RVTISVDTSKNQFSLKL RS VTAADTAVYYCAR	ERLGIDY	WGQGTLLVTVSS
12.119	RVTISVDTSKNQFSLKL RS VTAADTAVYYCAR	ERLGIDY	WGQGTLLVTVSS
12.120	RVTISVDTSKNQFSLKL RS VTAADTAVYYCAR	ERLGIDY	WGQGTLLVTVSS
12.121	RVTISVDTSKNQFSLKL RS VTAADTAVYYCAR	ERLGIDY	WGQGTLLVTVSS
12.122	RVTISVDTSKNQFSLKL RS VTAADTAVYYCAR	ERLGIDY	WGQGTLLVTVSS
12.123	RVTISVDTSKNQFSLKL RS VTAADTAVYYCAR	ERLGIDY	WGQGTLLVTVSS
Consensus	RVTISVDTSKNQFSLKL RS VTAADTAVYYCAR	ERLGIDY	WGQGTLLVTVSS

FIGURE 8

SEQ ID NO	Ab	FR1	CDR1	FR2	CDR2
16	Germline	DIQMTQSPSSLSASVGDRVITTC	RASQIRNDLG	WYQQKPGKAPKRLIY	AASSLQS
17	12	DIQLTQSPSSLSASVGDRVITTC	RASQIRNDLG	WYQQKPGKAPKRLIY	AASSLQS
17	12.6	DIQLTQSPSSLSASVGDRVITTC	RASQIRNDLG	WYQQKPGKAPKRLIY	AASSLQS
17	12.56	DIQLTQSPSSLSASVGDRVITTC	RASQIRNDLG	WYQQKPGKAPKRLIY	AASSLQS
17	12.118	DIQLTQSPSSLSASVGDRVITTC	RASQIRNDLG	WYQQKPGKAPKRLIY	AASSLQS
17	12.119	DIQLTQSPSSLSASVGDRVITTC	RASQIRNDLG	WYQQKPGKAPKRLIY	AASSLQS
17	12.120	DIQLTQSPSSLSASVGDRVITTC	RASQIRNDLG	WYQQKPGKAPKRLIY	AASSLQS
17	12.121	DIQLTQSPSSLSASVGDRVITTC	RASQIRNDLG	WYQQKPGKAPKRLIY	AASSLQS
17	12.122	DIQLTQSPSSLSASVGDRVITTC	RASQIRNDLG	WYQQKPGKAPKRLIY	AASSLQS
17	12.123	DIQLTQSPSSLSASVGDRVITTC	RASQIRNDLG	WYQQKPGKAPKRLIY	AASSLQS

Ab	FR3	CDR3	FR4
Germline	GVPSRFGSGSGTEFTLTISSLQPEDFATYYC	LQHNSYPPT	FGQGTKVEIK
12	GVPSRFGSGSGTEFTLTISSLQPEDFATYYC	LQHNTYPPT	FGQGTKVEIK
12.6	GVPSRFGSGSGTEFTLTISSLQPEDFATYYC	LQHNTYPPT	FGQGTKVEIK
12.56	GVPSRFGSGSGTEFTLTISSLQPEDFATYYC	LQHNTYPPT	FGQGTKVEIK
12.118	GVPSRFGSGSGTEFTLTISSLQPEDFATYYC	LQHNTYPPT	FGQGTKVEIK
12.119	GVPSRFGSGSGTEFTLTISSLQPEDFATYYC	LQHNTYPPT	FGQGTKVEIK
12.120	GVPSRFGSGSGTEFTLTISSLQPEDFATYYC	LQHNTYPPT	FGQGTKVEIK
12.121	GVPSRFGSGSGTEFTLTISSLQPEDFATYYC	LQHNTYPPT	FGQGTKVEIK
12.122	GVPSRFGSGSGTEFTLTISSLQPEDFATYYC	LQHNTYPPT	FGQGTKVEIK
12.123	GVPSRFGSGSGTEFTLTISSLQPEDFATYYC	LQHNTYPPT	FGQGTKVEIK

FIGURE 9

A. Ab12 VH nucleic acid (SEQ ID NO:36) and
corresponding amino acid sequence (SEQ ID NO:6)Ab

```

      Q V Q L Q E S G P G L V K P
1  CAGGTGCAGCTGCAGGAGTCGGGCCCAGGACTGGTGAAGCCT
   S E T L S L T C T V S G A S
43 TCGGAGACCCTGTCCCTCACCTGCACTGTCTCTGGTGCCTCC
   I S S Y Y W S W I R Q P P G
85 ATCAGTAGTTACTACTGGAGCTGGATCCGGCAGCCCCCAGGG
   K G L E W I G Y I Y Y S G S
127 AAGGGACTGGAGTGGATTGGGTATATCTATTACAGTGGGAGC
   T N Y N P S L K S R V T I S
169 ACCAACTACAACCCCTCCCTCAAGAGTCGAGTCACCATATCA
   V D T S K N Q F S L K L R S
211 GTAGACACGTCCAAGAACCAGTTCTCCCTGAAGCTGAGGTCT
   V T A A D T A V Y Y C A R E
253 GTGACCGCTGCGGACACGGCCGTGTATTACTGTGCGAGAGAG
   R L G I G D Y W G Q G T L V
295 CGACTGGGGATCGGGGACTACTGGGGCCAGGGAACCCTGGTC
   T V S S
337 ACCGTCTCCTCA

```

B. Ab12.6 VH nucleic acid (SEQ ID NO:27) and
corresponding amino acid sequence (SEQ ID NO:7)

```

      Q V Q L Q E S G P G L V K P
1  CAGGTGCAGCTGCAGGAGTCGGGCCCAGGACTGGTGAAGCCT
   S E T L S L T C T V S G A S
43 TCGGAGACCCTGTCCCTCACCTGCACTGTCTCTGGTGCCTCC
   I S S Y Y W S W I R Q P P G
85 ATCAGTAGTTACTACTGGAGCTGGATCCGGCAGCCCCCAGGG
   K G L E W I G Y I G G E G S
127 AAGGGACTGGAGTGGATTGGGTATATCGGGGGGAGGGGAGC
   T N Y N P S L K S R V T I S
169 ACCAACTACAACCCCTCCCTCAAGAGTCGAGTCACCATATCA
   V D T S K N Q F S L K L R S
211 GTAGACACGTCCAAGAACCAGTTCTCCCTGAAGCTGAGGTCT
   V T A A D T A V Y Y C A R E
253 GTGACCGCTGCGGACACGGCCGTGTATTACTGTGCGAGAGAG
   R L G I G D Y W G Q G T L V
295 CGACTGGGGATCGGGGACTACTGGGGCCAGGGAACCCTGGTC
   T V S S
337 ACCGTCTCCTCA

```

FIG. 9 (con't)

C. Ab12.56 VH nucleic acid (SEQ ID NO:28) and corresponding amino acid sequence (SEQ ID NO:8)

Q V Q L Q E S G P G L V K P
1 CAGGTGCAGCTGCAGGAGTCGGGCCCAGGACTGGTGAAGCCT
S E T L S L T C T V S G A S
43 TCGGAGACCCTGTCCCTCACCTGCACTGTCTCTGGTGCCTCC
I S S Y Y W S W I R Q P P G
85 ATCAGTAGTTACTACTGGAGCTGGATCCGGCAGCCCCCAGGG
K G L E W I G Y I A G T G S
127 AAGGGACTGGAGTGGATTGGGTATATCGCCGGGACGGGGAGC
T N Y N P S L K S R V T I S
169 ACCAACTACAACCCCTCCCTCAAGAGTCGAGTCACCATATCA
V D T S K N Q F S L K L R S
211 GTAGACACGTCCAAGAACCAGTTCTCCCTGAAGCTGAGGTCT
V T A A D T A V Y Y C A R E
253 GTGACCGCTGCGGACACGGCCGTGTATTACTGTGCGAGAGAG
R L G I G D Y W G Q G T L V
295 CGACTGGGGATCGGGGACTACTGGGGCCAGGGAACCTGGTC
T V S S
337 ACCGTCTCCTCA

D. Ab12.118 VH nucleic acid (SEQ ID NO:29) and corresponding amino acid sequence (SEQ ID NO:9)

Q V Q L Q E S G P G L V K P
1 CAGGTGCAGCTGCAGGAGTCGGGCCCAGGACTGGTGAAGCCT
S E T L S L T C T V S G A S
43 TCGGAGACCCTGTCCCTCACCTGCACTGTCTCTGGTGCCTCC
I S S Y Y W S W I R Q P P G
85 ATCAGTAGTTACTACTGGAGCTGGATCCGGCAGCCCCCAGGG
K G L E W I G Y I G Y S G S
127 AAGGGACTGGAGTGGATTGGGTATATCGGTTACAGTGGGAGC
T N Y N P S L K S R V T I S
169 ACCAACTACAACCCCTCCCTCAAGAGTCGAGTCACCATATCA
V D T S K N Q F S L K L R S
211 GTAGACACGTCCAAGAACCAGTTCTCCCTGAAGCTGAGGTCT
V T A A D T A V Y Y C A R E
253 GTGACCGCTGCGGACACGGCCGTGTATTACTGTGCGAGAGAG
R L G I G D Y W G Q G T L V
295 CGACTGGGGATCGGGGACTACTGGGGCCAGGGAACCCTGGTC
T V S S
337 ACCGTCTCCTCA

FIG. 9 (con't)

E. Ab12.119 VH nucleic acid (SEQ ID NO:30) and corresponding amino acid sequence (SEQ ID NO:10)

```

      Q V Q L Q E S G P G L V K P
1  CAGGTGCAGCTGCAGGAGTCGGGCCCAGGACTGGTGAAGCCT
   S E T L S L T C T V S G A S
43 TCGGAGACCCTGTCCCTCACCTGCACTGTCTCTGGTGCCTCC
   I S S Y Y W S W I R Q P P G
85 ATCAGTAGTTACTACTGGAGCTGGATCCGGCAGCCCCCAGGG
   K G L E W I G Y I Y G S G S
127 AAGGGACTGGAGTGGATTGGGTATATCTATGGCAGTGGGAGC
   T N Y N P S L K S R V T I S
169 ACCAACTACAACCCCTCCCTCAAGAGTCGAGTCACCATATCA
   V D T S K N Q F S L K L R S
211 GTAGACACGTCCAAGAACCAGTTCTCCCTGAAGCTGAGGTCT
   V T A A D T A V Y Y C A R E
253 GTGACCGCTGCGGACACGGCCGTGTATTACTGTGCGAGAGAG
   R L G I G D Y W G Q G T L V
295 CGACTGGGGATCGGGGACTACTGGGGCCAGGGAACCCTGGTC
   T V S S
337 ACCGTCTCCTCA

```

F. Ab12.120 VH nucleic acid (SEQ ID NO:31) and corresponding amino acid sequence (SEQ ID NO:11)

```

      Q V Q L Q E S G P G L V K P
1  CAGGTGCAGCTGCAGGAGTCGGGCCCAGGACTGGTGAAGCCT
   S E T L S L T C T V S G A S
43 TCGGAGACCCTGTCCCTCACCTGCACTGTCTCTGGTGCCTCC
   I S S Y Y W S W I R Q P P G
85 ATCAGTAGTTACTACTGGAGCTGGATCCGGCAGCCCCCAGGG
   K G L E W I G Y I Y Y E G S
127 AAGGGACTGGAGTGGATTGGGTATATCTATTACGAAGGGAGC
   T N Y N P S L K S R V T I S
169 ACCAACTACAACCCCTCCCTCAAGAGTCGAGTCACCATATCA
   V D T S K N Q F S L K L R S
211 GTAGACACGTCCAAGAACCAGTTCTCCCTGAAGCTGAGGTCT
   V T A A D T A V Y Y C A R E
253 GTGACCGCTGCGGACACGGCCGTGTATTACTGTGCGAGAGAG
   R L G I G D Y W G Q G T L V
295 CGACTGGGGATCGGGGACTACTGGGGCCAGGGAACCCTGGTC
   T V S S
337 ACCGTCTCCTCA

```

FIGURE 9 (cont.)

G. Ab12.121 VH nucleic acid (SEQ ID NO:32) and
corresponding amino acid sequence (SEQ ID NO:12)

	Q	V	Q	L	Q	E	S	G	P	G	L	V	K	P																												
1	C	A	G	G	T	G	C	A	G	C	T	G	C	A	G	G	A	G	T	C	G	G	G	C	C	C	A	G	G	A	C	T	G	G	T	G	A	A	G	C	C	T
	S	E	T	L	S	L	T	C	T	V	S	G	A	S																												
43	T	C	G	G	A	G	A	C	C	T	G	T	C	C	C	T	C	A	C	C	T	G	C	A	C	T	G	T	C	T	C	T	G	G	T	G	C	C	T	C		
	I	S	S	Y	Y	W	S	W	I	R	Q	P	P	G																												
85	A	T	C	A	G	T	A	G	T	T	A	C	T	A	C	T	G	G	A	G	C	T	G	G	A	T	C	C	G	G	C	A	G	C	C	C	C	C	A	G	G	G
	K	G	L	E	W	I	G	Y	I	G	G	S	G	S																												
127	A	A	G	G	G	A	C	T	G	G	A	G	T	G	G	A	T	T	G	G	G	T	A	T	A	T	C	G	G	G	G	G	G	T	C	G	G	G	G	A	G	C
	T	N	Y	N	P	S	L	K	S	R	V	T	I	S																												
169	A	C	C	A	A	C	T	A	C	A	A	C	C	C	C	T	C	C	C	T	C	A	A	G	A	G	T	C	G	A	G	T	C	A	C	C	A	T	A	T	C	A
	V	D	T	S	K	N	Q	F	S	L	K	L	R	S																												
211	G	T	A	G	A	C	A	G	T	C	C	A	A	G	A	A	C	C	A	G	T	T	C	T	C	C	C	T	G	A	A	G	C	T	G	A	G	G	T	C	T	
	V	T	A	A	D	T	A	V	Y	Y	C	A	R	E																												
253	G	T	G	A	C	C	G	C	T	G	C	G	A	C	A	C	G	G	C	C	G	T	G	T	A	T	A	C	T	G	T	G	C	G	A	G	A	G	A	G		
	R	L	G	I	G	D	Y	W	G	Q	G	T	L	V																												
295	C	G	A	C	T	G	G	G	G	A	T	C	G	G	G	G	A	C	T	A	C	T	G	G	G	G	C	C	A	G	G	G	A	A	C	C	T	G	G	T	C	
	T	V	S	S																																						
337	A	C	C	G	T	C	T	C	C	T	C	A																														

H. Ab12.122 VH nucleic acid (SEQ ID NO:33) and
corresponding amino acid sequence (SEQ ID NO:13)

	Q	V	Q	L	Q	E	S	G	P	G	L	V	K	P																												
1	C	A	G	G	T	G	C	A	G	C	T	G	C	A	G	G	A	G	T	C	G	G	G	C	C	C	A	G	G	A	C	T	G	G	T	G	A	A	G	C	C	T
	S	E	T	L	S	L	T	C	T	V	S	G	A	S																												
43	T	C	G	G	A	G	A	C	C	T	G	T	C	C	C	T	C	A	C	C	T	G	C	A	C	T	G	T	C	T	C	T	G	G	T	G	C	C	T	C		
	I	S	S	Y	Y	W	S	W	I	R	Q	P	P	G																												
85	A	T	C	A	G	T	A	G	T	T	A	C	T	A	C	T	G	G	A	G	C	T	G	G	A	T	C	C	G	G	C	A	G	C	C	C	C	C	A	G	G	G
	K	G	L	E	W	I	G	Y	I	Y	G	E	G	S																												
127	A	A	G	G	G	A	C	T	G	G	A	G	T	G	G	A	T	T	G	G	G	T	A	T	A	T	C	T	A	T	G	G	G	G	A	A	G	G	G	A	G	C
	T	N	Y	N	P	S	L	K	S	R	V	T	I	S																												
169	A	C	C	A	A	C	T	A	C	A	A	C	C	C	C	T	C	C	C	T	C	A	A	G	A	G	T	C	G	A	G	T	C	A	C	C	A	T	A	T	C	A
	V	D	T	S	K	N	Q	F	S	L	K	L	R	S																												
211	G	T	A	G	A	C	A	G	T	C	C	A	A	G	A	A	C	C	A	G	T	T	C	T	C	C	C	T	G	A	A	G	C	T	G	A	G	G	T	C	T	
	V	T	A	A	D	T	A	V	Y	Y	C	A	R	E																												
253	G	T	G	A	C	C	G	C	T	G	C	G	A	C	A	C	G	G	C	C	G	T	G	T	A	T	A	C	T	G	T	G	C	G	A	G	A	G	A	G		
	R	L	G	I	G	D	Y	W	G	Q	G	T	L	V																												
295	C	G	A	C	T	G	G	G	G	A	T	C	G	G	G	G	A	C	T	A	C	T	G	G	G	G	C	C	A	G	G	G	A	A	C	C	T	G	G	T	C	
	T	V	S	S																																						
337	A	C	C	G	T	C	T	C	C	T	C	A																														

FIGURE 9 (cont.)

I. Ab12.123 VH nucleic acid (SEQ ID NO:34) and
corresponding amino acid sequence (SEQ ID NO:14)

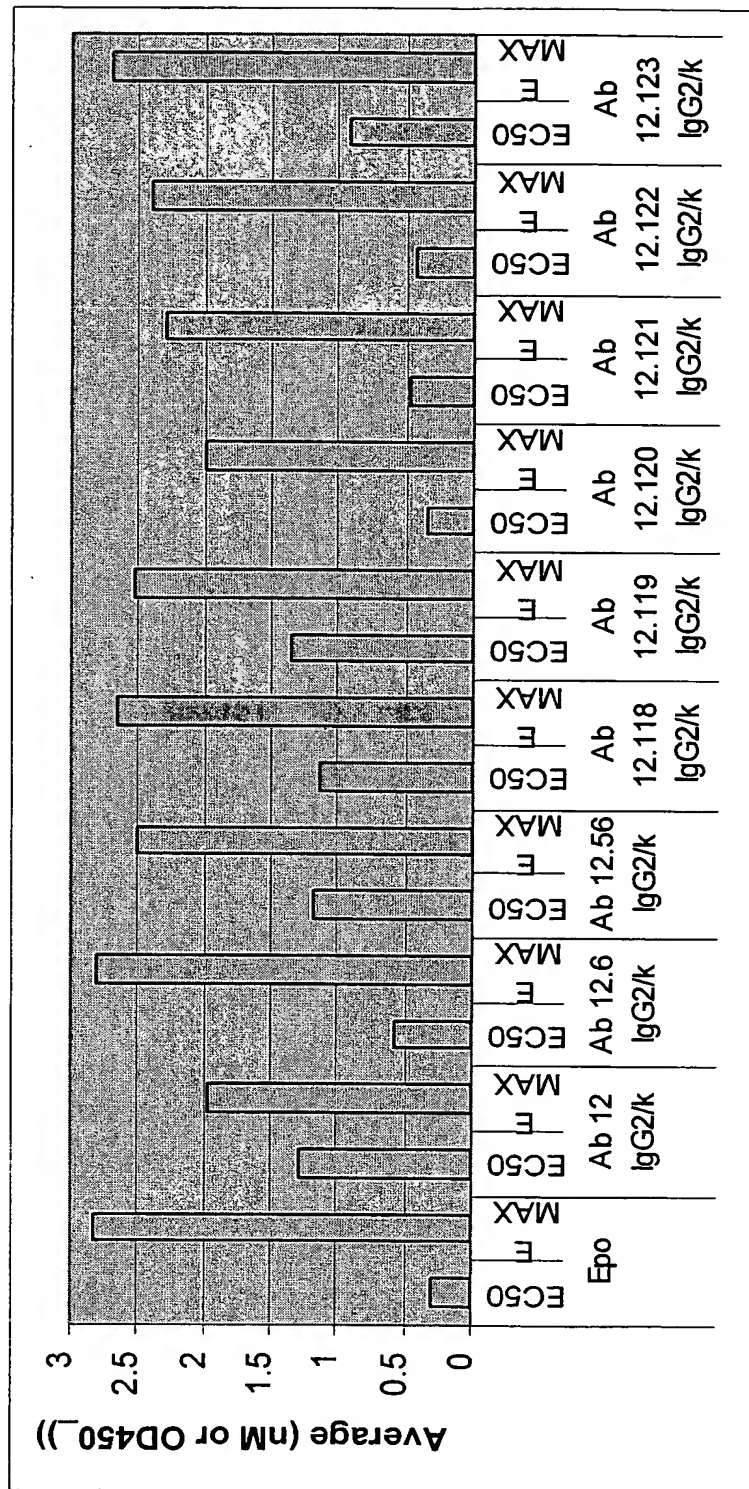
```
      Q V Q L Q E S G P G L V K P
1  CAGGTGCAGCTGCAGGAGTCGGGCCCAGGACTGGTGAAGCCT
   S E T L S L T C T V S G A S
43 TCGGAGACCCTGTCCCTCACCTGCACTGTCTCTGGTGCCTCC
   I S S Y Y W S W I R Q P P G
85 ATCAGTAGTTACTACTGGAGCTGGATCCGGCAGCCCCCAGGG
   K G L E W I G Y I G Y E G S
127 AAGGGACTGGAGTGGATTGGGTATATCGGGTACGAGGGGAGC
   T N Y N P S L K S R V T I S
169 ACCAACTACAACCCCTCCCTCAAGAGTCGAGTCACCATATCA
   V D T S K N Q F S L K L R S
211 GTAGACACGTCCAAGAACCAGTTCTCCCTGAAGCTGAGGTCT
   V T A A D T A V Y Y C A R E
253 GTGACCGCTGCGGACACGGCCGTGTATTACTGTGCGAGAGAG
   R L G I G D Y W G Q G T L V
295 CGACTGGGGATCGGGGACTACTGGGGCCAGGGAACCCTGGTC
   T V S S
337 ACCGTCTCCTCA
```

FIGURE 10

VL nucleic acid (SEQ ID NO:35) and corresponding
amino acid sequence (SEQ ID NO:17)Ab of Ab12,
Ab12.6 and Ab12.6-related antibodies

```
      D I Q L T Q S P S S L S A S
1  GACATCCAGCTGACCCAATCTCCATCCTCCCTGTCTGCATCT
   V G D R V T I T C R A S Q G
43 GTAGGAGACAGAGTCACCATCACTTGCCGGGCAAGTCAGGGC
   I R N D L G W Y Q Q K P G K
85 ATTAGAAATGATTTAGGCTGGTATCAGCAGAAACCAGGGAAA
   A P K R L I Y A A S S L Q S
127 GCCCCTAAGCGCCTGATCTATGCTGCATCCAGTTTGCAAAGT
   G V P S R F S G S G S G T E
169 GGGGTCCCATCAAGGTTTCAGCGGCAGTGGATCTGGGACAGAA
   F T L T I S S L Q P E D F A
211 TTCACTCTCACAATCAGCAGCCTGCAGCCTGAAGATTTTGCA
   T Y Y C L Q H N T Y P P T F
253 ACTTATTACTGTCTACAGCATAATACTTACCCTCCGACGTTC
   G Q G T K V E I K
295 GGCCAAGGGACCAAGGTGGAAATCAAA
```

FIGURE 11



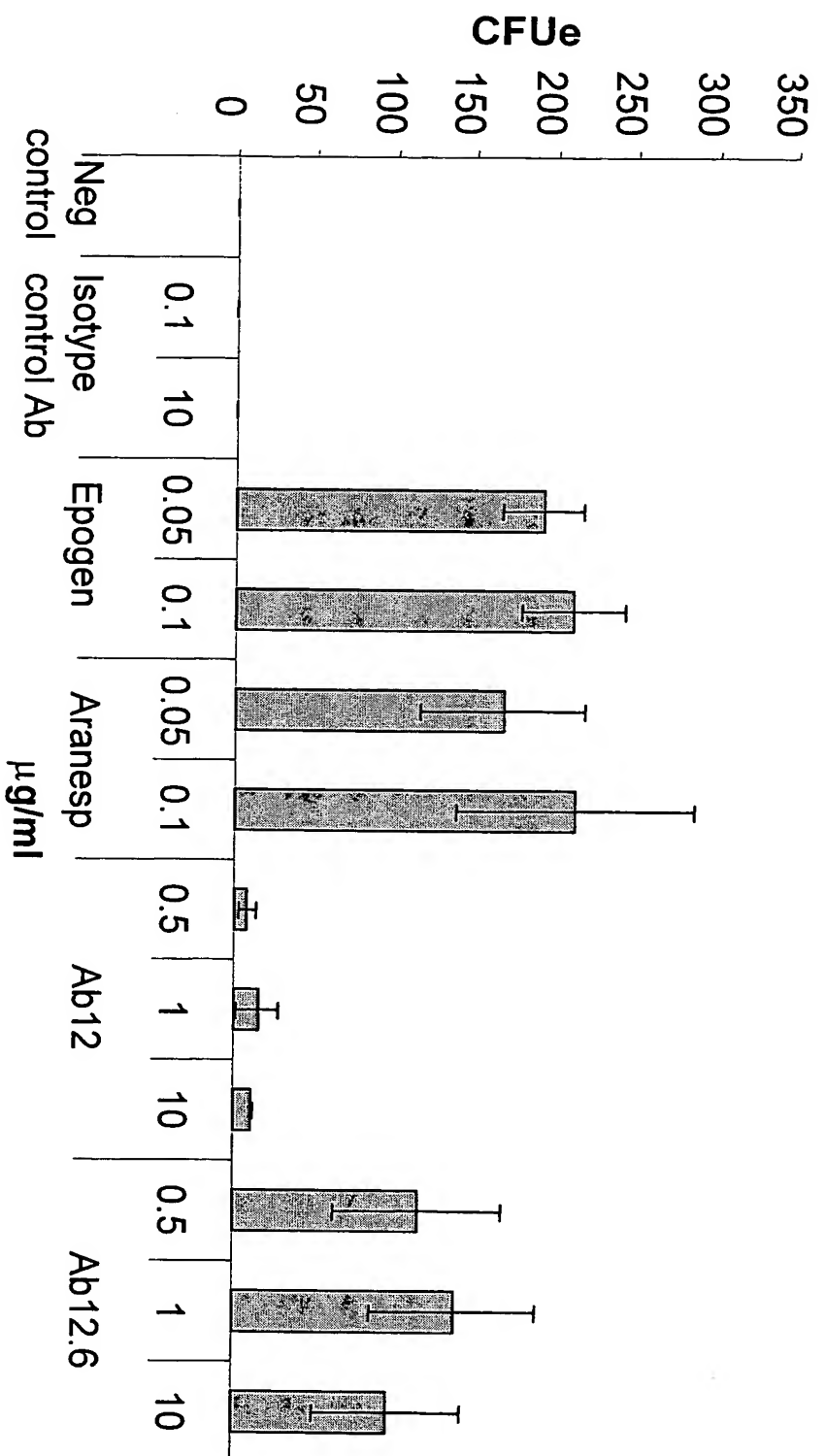


Figure 12

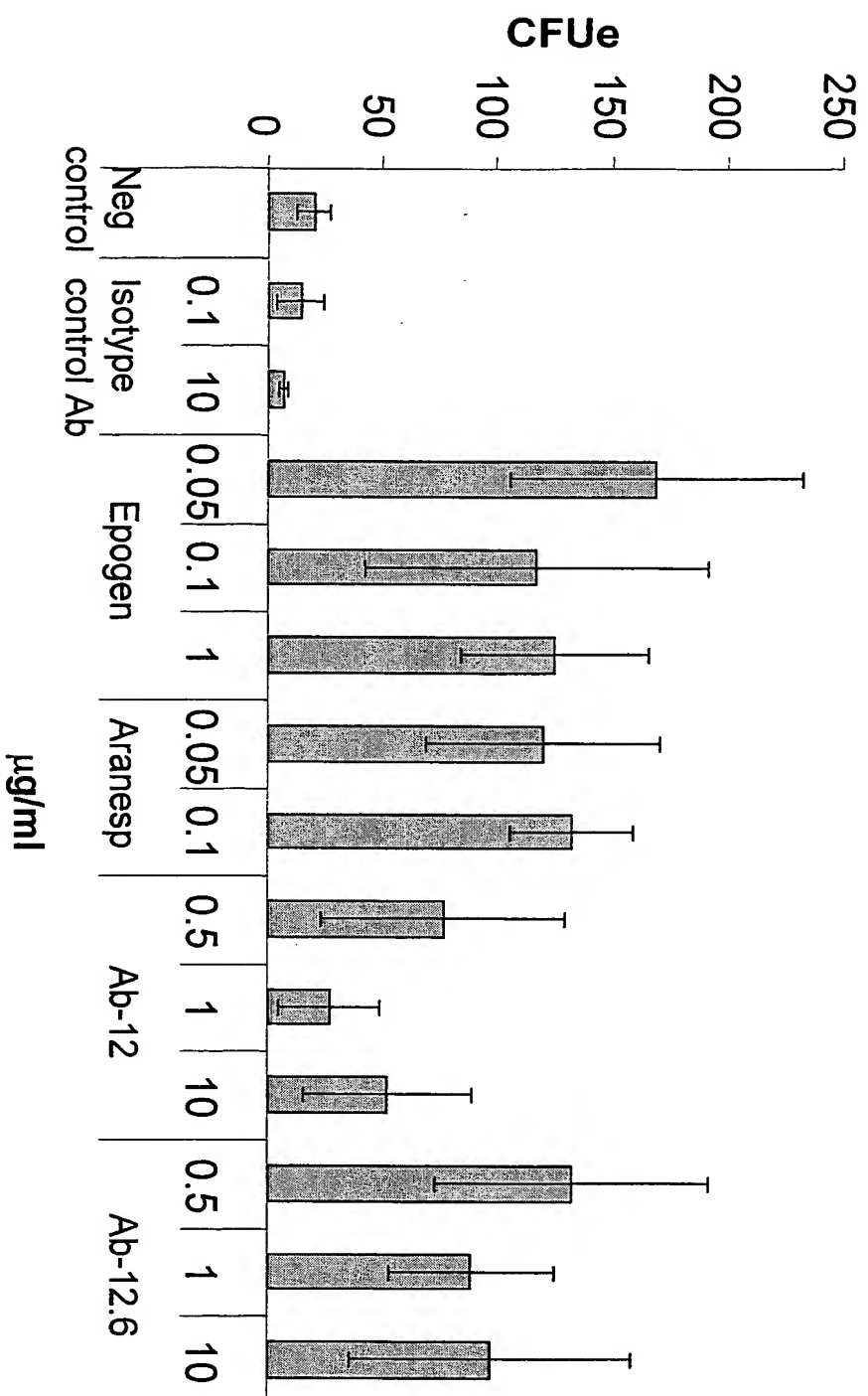


Figure 13

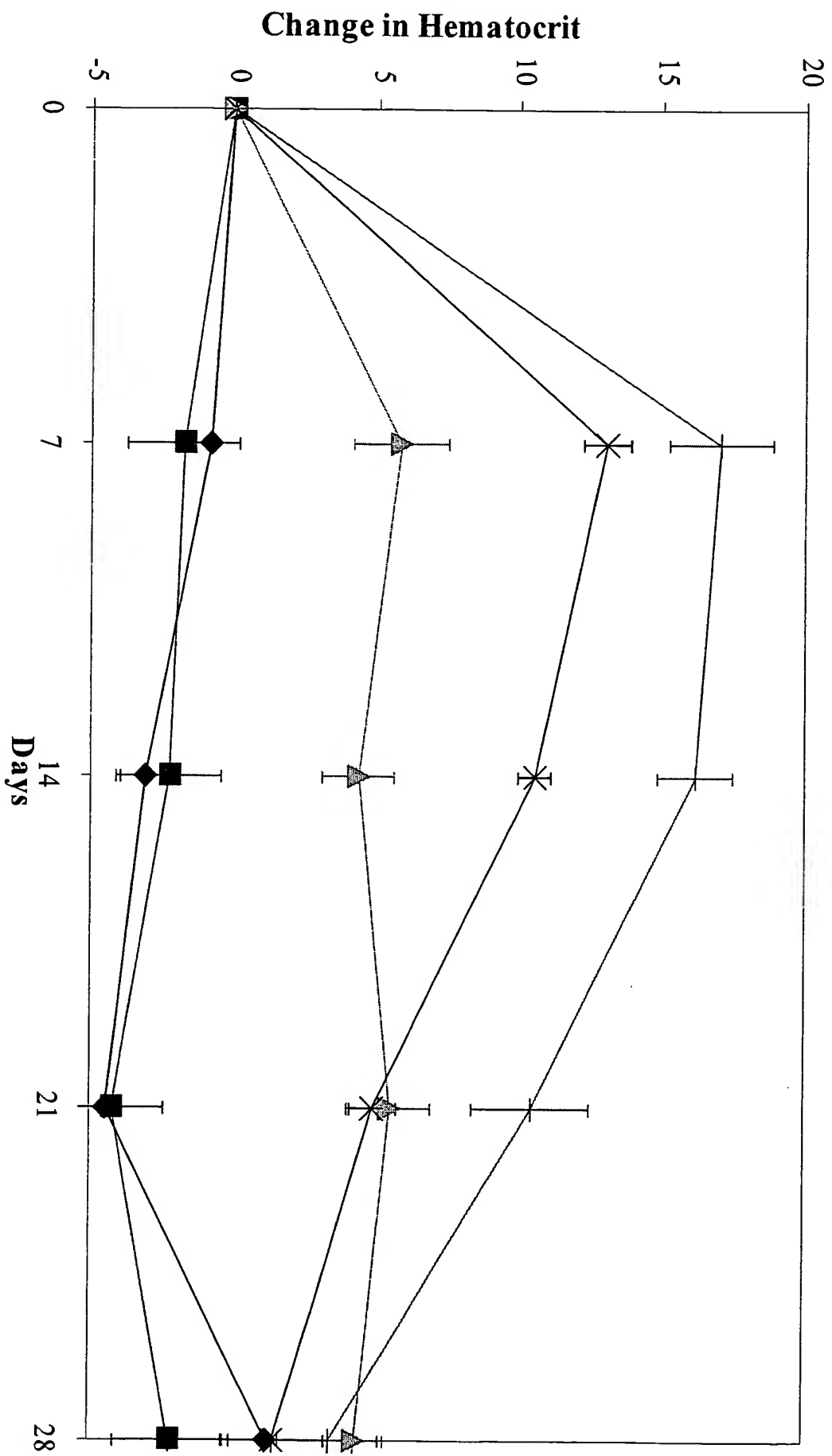


FIGURE 14